Patton Harris Rust & Associates
Engineers. Surveyors. Planners. Landscape Architects.

March 16, 2009

Mr. Timothy P. Harms
Vint Hill Economic Development Authority
4263 Aiken Drive, PO Box 861617
Warrenton, VA 20817

Re: Vint Hill Finch Lane
Site Plan Submission VDOT Chapter 527 Compliance
Fauquier County, VA
PHR+A #10428-E-9

PHR+A

CORPORATE:
Chantilly

VIRGINIA OFFICES:
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14532 Lee Road
Chantilly, VA
20151-1679

Dear Mr. Harms:

As part of the requirements of VDOT's Chapter 527 regulations, a traffic impact analysis must be submitted with any site plan if the site trip generation is over a certain threshold. On behalf of the developer, Vint Hill Economic Development Authority, PHR+A is submitting the site plan for the commercial uses along Finch Lane. The following paragraphs outline our understanding of the Code of Virginia Section 15.2-2222.1 and the Traffic Impact Analysis Regulations 24 VAC 30-155-50 for site plans in relation to the proposed land use activity. For the subject site, the proposed trip generation document that additional Chapter 527 review is **not** required.

Trip Generation

The development of the subject site was originally approved with the previous zoning of Vint Hill with office/warehouse adjacent to Aiken Road/Finch Lane in Land Bay V. The current development envisions three buildings with employment uses with two street access to Finch Lane. The three pad sites for the office and warehouse totaled 43,702 gsf of office space and 16,607 gsf of warehouse space. The total development comprises 60,309 gross square feet.

The Office (ITE Code 710) is proposed at the individual building sizes of 15,000, 36,000 and 9309 gsf. The warehouse is proposed at 16,607 gsf . Trip generation for the peak hours, the peak hour of the generator, and total daily trips were computed reflecting the site plan uses with ranges of trips based on the Institute of Transportation Engineers (ITE) *Trip Generation (8th Edition)* trip variables are summarized in the Table 1. The VDOT Chapter 527 comparisons are included in Table 2 showing the maximum trip generation associated with the proposed site plans (inbound and outbound are not shown in Table 2, since they are not relevant to the 527 threshold analysis). Note that the office trip rates exceed the average rates due to the small building sizes, as shown in the bottom of Table 1.

PHR+A

TABLE 2
MAXIMUM SITE PLAN TRIP GENERATION

Use	PM Peak	PM Peak Hour of Generator	Daily Trips (VPD)
Office@ 43,702 sq. ft.	220	220	823
Warehouse@ 16,607 sq. ft.	5	7	59
Total Site Plan	225	227	882
VDOT Threshold	NO< 250	NO< 250	NO< 2,500

Source: ITE Trip Generation, 8th Edition, (Computations by PHR+A) See Table 1 for details.

For a traffic impact analysis to be required for commercial uses (other uses), the total peak hour trips must exceed 250 trips per hour. The peak trips over one hour for this site is 225 trips, so the threshold is not reached. The threshold for daily trips is 2,500, which is far greater than the 882 generated by this site development.

The proposed site generated trips associated with the site plan do not satisfy the threshold requiring a VDOT 527 review. Therefore, a VDOT 527 review is not required with the proposed site plan submission.

If you have any questions, please feel free to contact us.

Sincerely,
PATTON HARRIS RUST & ASSOCIATES, INC.

Douglas R. Kennedy, P.E.
Vice President
Director of Transportation Planning
P:\PROJECT\12178\2-2\corres\VDOT 527 Letter. doc

Enclosure: Table 1

cc: Bobby K.Mangalath – PHR+A
Fred D. Ameen – PHR+A

Table 1
527 Trip Generation Summary

ITE Land Use (1) CODE	CODE	DENSITY	Var.	USE	AM PEAK HOUR IN	AM PEAK HOUR OUT	AM PEAK HOUR TOTAL	PM PEAK HOUR IN	PM PEAK HOUR OUT	PM PEAK HOUR TOTAL	DAILY (2-way)
Proposed Site Plan Uses											
	Site I										
710	710.730	15.000	ksf	Office @ 15,000 gsf	36	5	41	16	80	96	310
	Site II										
710	710.740	24.000	ksf	Office @ 36,000 gsf	48	7	55	13	66	79	405
150	150.000	12.000	ksf	Warehouse	3	1	4	1	3	4	43
150	151.000	12.000	ksf	Warehouse (Generator)	3	2	5	1	4	5	43
	Site III										
710	710.732	4.702	ksf	Office @ 9,309 gsf	12	2	14	8	37	45	108
150	150.000	4.607	ksf	Warehouse	1	0	1	0	1	1	16
150	151.000	4.607	ksf	Warehouse (Generator)	1	1	2	0	2	2	16
				Site Trips, Peak Hour	100	15	115	38	187	225	882
				Site Trips, Peak Hour Generator				38	189	227	

ITE Land Use (1) CODE	CODE		VDOT 527 Check Site Plan
710	710.73	15	ksf Office @ 15,000 gsf
710	710.74	24.000	ksf Office @ 36,000 gsf
710	710.73	24.000	ksf Office @ 9,309 gsf
150	150.00	16.607	ksf Warehouse

Peak Hour Of Use, No Adjustments		
Peak hr of Street, no adj.	225	882
Peak hr of Generator	7	59
Saturday Generator	24	
Ex. Uses, no counts	0	0
Net Trips	225	882
Mixed Use Threshold for Rezoning/Site Plan	**250**	**2,500**
527 Required?	**NO**	**NO**

Effective Trip Rates (2)			AM Peak Hour (2-way)	AM Peak Hour Inbound %	PM Peak Hour (2-way)	PM Peak Hour Inbound %	Daily (2-way)
710	Office Average	ksf	2.52	87%	5.03	17%	18.83
710	Office @ 15,000 gsf	ksf	2.73	88%	6.40	17%	20.67
710	Office @ 36,000 gsf	ksf	2.29	87%	3.29	16%	16.88
710	Office @ 9,309 gsf	ksf	2.98	86%	9.57	18%	22.97
150	Warehouse	ksf	0.22	100%	0.22	0%	3.47
150	Warehouse (Generator)	ksf	0.43	50%	0.43	0%	3.47

TRIP RATE SOURCE:

Trip Generation Manual (8th Edition), Institute of Transportation Engineers; 2008.

Average trip rates used, unless noted with * then equations used.

(1) ITE Land Code shown as the first 3 digits. Decimal shown for internal use by PHR+A for lookup table for trip rate variable.

(2) Efective trip rates calculated by land use:

For average rates = Density * ave. trip rate = 2-way Trips ; * inbound percentage for Trips In

For ITE equations = Density * trip equation = 2-way Trips ; * inbound percentage for Trips In

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Mr. Timothy P. Harms
Vint Hill Economic Development Authority
4263 Aiken Drive
PO Box 861617
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PHR+A

Re: Vint Hill Finch Lane
Turn Lane Warrant Analysis
Fauquier County, VA
PHR+A #10428-E-9

CORPORATE:
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Dear Mr. Harms:

As requested, the following summarizes our technical review of the turn lane requirement for the intersection of Finch Lane (VA Route 652)/Rogues Road (VA Route 602) as part of the Vint Hill short-term development. PHR+A was requested to assess the existing conditions on Rogues Road and advise if the opening of the Kettle Run High School at Academy Avenue would require additional turn lanes. The ultimate land development plan for Vint Hill did not envision Finch Lane as a major access route, so the opportunity to utilize the existing access would provide increased access opportunities as the community grows. PHR+A's purpose in this analysis was to document existing conditions and verify if the VDOT turn lane warrants are satisfied. The analysis also contrasts the current turn lane lengths from the VDOT Road Design Manual and AASHTO Guidelines. Based on the enclosed analyses, PHR+A recommends that a northbound left turn lane and a southbound right turn lane on Route 602 are **not** warranted; however a right turn lane is warranted on Finch Lane, as shown in **Table 1**. The following paragraphs summarize our preliminary findings.

TABLE 1: ROGUES ROAD AND FINCH LANE TURNING LANE SUMMARY

	VDOT Guidelines	Existing Warrant	Future Warrant
NB Left Turn (Rogues Road)	**100' turn + 200' taper** (275'+140' taper@ 40 MPH, AASHTO)	No	No
EB Right Turn (Finch Lane)	**100' turn + 100' taper**	Yes	Yes
SB Right Turn (Rogues Road)		No	No

Based on the traffic generations with acceptable Level of Service (LOS) "C" or better, PHR+A would recommend that the existing configuration remain at Finch Lane/Rogues Road to support existing and short-term traffic.

If requested by the reviewing agencies, this summary should provide a justification to VDOT and the County to justify the proposed operations associated with the submitted plans, without negatively impacting VDOT and County road standards.

LOCATION

PHR+A

The site is located adjacent to Aiken Road/Finch Lane and is designated as a portion of Land Bay V . The site was originally approved with the previous zoning of Vint Hill with office/warehouse The current development envisions three buildings with employment uses with two street access to Finch Lane. The three pad sites for the office and warehouse totaled 43,702 gsf of office space and 16,607 gsf of warehouse space. The total proposed site plan comprises 60,309 gross square feet.

EXISTING CONDITIONS

Finch Lane is a two lane non-divided local street with a posted 25 mph speed limit. Rogues Road (VA Route 602) is a two lane non-divided collector. Both of these roads do not have a separate left or right turn lanes. The intersection of Finch Lane/Rogues Road is stop controlled.

In order to document existing traffic conditions PHR+A collected manual turning material counts as the subject intersection on Wednesday, November 12, 2008. The AM peak occurs between 7:00 and 8:00 AM and the PM peak occurs between 4:45 and 5:45 PM. The traffic volumes included the existing school traffic, and included turning movement counts at Academy Avenue/ Grapewood Drive. PHR+A reviewed the traffic analysis for the High School site, Traffic Impact Analysis for the Proposed High School Route 602; Lunceford Property, prepared by MCV + Associates, Inc, and dated February 22, 2006. The turning volumes at the school signal are less than the projected turning volumes during the AM peak on Rogues Road, south of Finch Lane. The PM projections from the MCV 2006 study are higher in the PM peak than the 2008 counts, since the trip generation for the Scholl utilized a Friday PM peak scenario, to maximize trips for a typical high school football game.

The link volumes on Finch Lane were also checked with a mechanical tube counter the third week of November 2008. The effective daily traffic volumes west of Rogues Road was 1877 vpd. The peak period traffic counts and tube counts are included in Appendix A. VDOT published daily counts (2007) for Route 602 have 4,200 VPD daily trips between Old Chapel Road and the Prince William County line. Based on the field counts and the PM K factor of 0.11, existing Daily trips on Rogues Road are estimated at approximately 3,200 vpd.

Based on the existing peak hour counts, the southbound volumes turning right at Finch lane are less than 10 vehicles per hour. Based on the VDOT right turn lane guidelines from the *Road Design Manual*, Figure C-1-8 for two lane roads, as shown in **Figure 1**, the existing traffic volumes do not warrant a separate right turn lane on Rogues Road to Finch Lane. The traffic eastbound volumes turning right at Rogues Road are between 75 and 125 vehicles per hour. Based on the VDOT right turn lane guidelines from the *Road Design Manual*, Figure C-1-8 for two lane roads, as shown in **Figure 2**, the existing traffic volumes warrant a separate right turn lane on Finch Lane to Rogues Road. The turn lane guidelines reflect peak hour vehicles (PHV) making a right turn on the Y Axis and the total trips on southbound Rogues Road or Finch Lane on the X Axis.

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The traffic northbound volumes turning left at Rogues Road are between 131 and 66 vehicles per hour. Based on the VDOT left turn lane guidelines from the *Road Design Manual*, Figure C-1-1.4 for two lane roads, as shown in **Figures 3 and** 4, the existing traffic volumes do not warrant a separate left turn lane on Rogues Road to Finch Lane. Note that the AM peak volumes left are in the peak direction, so the operations are acceptable.

EXISTING LEVELS OF SERVICE

The traffic operations for the existing conditions are summarized in Table 2, with the Highway Capacity Manual Software (HCS) outputs in Appendix B. The results show acceptable LOS "B" or better for the left turns. The side street LOS is shown with a shared left/right in one lane, even though the right turns were observed to cut around the left turn vehicles.

TABLE 2: EXISTING 2008 INTERSECTION LEVELS OF SERVICE

Intersection		AM Peak Hour LOS	AM Peak Hour Delay	PM Peak Hour LOS	PM Peak Hour Delay
Rogues Rd @ Finch Lane	NB LT	A	7.7	A	8.0
Unsignalized	EB LR	A	9.3	B	11.6

LOS = Levels of Service; Delay = Delay in seconds.
Delay shown in seconds for lane group. For unsignalized intersections, LOS shown for conflicting movements. No overall LOS grade provided.

FUTURE TRAFFIC VOLUMES

To verify site access requirements, the existing 2008 traffic counts were grown at an annual growth rate of 5.0 percent per year, and the site trips were added. The comparisons of the traffic volumes with previous PHR+A counts, as well as the High School counts in 2007, are summarized in **Table 3**. Trip generation for the 43,702 GSF office and the 16,607 GSF warehouse was calculated based on the ITE *Trip Generation* Manual (8th Edition) equations, without reductions for transit. The trip generation is

shown in **Table 4**, and was assigned to the subject intersection based on existing travel patterns and previous distributions for Vint Hill Land Bay V. The peak hour assignments associated with the subject site plan are shown in **Table 5.** A summary of the peak hour turning volumes is included as **Figure 5** for existing and short-term conditions.

TABLE 5: VINT HILL OFFICE PEAK HOUR SITE ASSIGNMENTS

Movement	%	AM Peak	PM Peak
SB R	10%	10	4
NB L	15%	15	6
EB L	(10%)	2	19
EB R	(15%)	2	28

Legend: Inbound % (Outbound %)

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For a 2014 design year, the combination of existing traffic, growth and site trips results in peak hour right turn volumes which warrant a right turn lane on Finch Lane. The turn lane worksheets are included as **Figure 6** for the southbound rights and **Figure 7** for the eastbound rights. As shown in **Figures 8 and 9**, the peak hour volume are below the warrant thresholds for left turn with the build-out of Finch Lane parcel, and localized growth in the next 5 years.

FUTURE INTERSECTION OPERATIONS

With the localized regional growth existing school trips and site activities at Vint Hill in the next 5 years, the effective traffic volumes on Finch Lane would increase to approximately 2,800 vpd. Traffic Volumes on Rogues Road will increase to approximately 4,300 VPD. With the existing traffic operations, the left turn operations continue at LOS "C" or better conditions, as summarized in **Table 6**. The LOS worksheets are shown in Appendix C.

TABLE 6: FUTURE 2014 INTERSECTION LEVELS OF SERVICE

Intersection		AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
Rogues Rd @ Finch Lane	NB LT	A	7.9	A	8.5
Unsignalized	EB LR	A	9.8	C	17.0

LOS = Levels of Service; Delay = Delay in seconds

Delay shown in seconds for lane group. For unsignalized intersections, LOS shown for conflicting movements. No overall LOS grade provided.

TURN LANE REQUIREMENTS

The future conditions do not include a need for a separate left turn lane On Northbound Rogues, but the VDOT charts suggests a right turn lane on Finch Lane would be justified in the existing conditions and future conditions. Due to the lack of through trips on Finch Lane eastbound, minimal peak hour left stacking, and the right turn vehicles

who stack adjacent to the lefts as a 'defacto' right turn, PHR+A would not recommend modifying the Finch Lane approach to accommodate a separate turn lane on the side street, since the LOS is at LOS "A" in the AM peak, with the school trips, and at LOS "C" in the PM peak, with the additional through trips on southbound Rogues Road. Based on the current VDOT Design Standards, the 100' minimum length would apply for the storage and the taper is 200' on Rogues Road and 100' on Finch Lane. Final transition for left turn lanes on Rogues Road, if constructed, would need to reflect the current VDOT guidelines, based on design speed to allow separate transition, taper, and storage on northbound Rogues Road. Since these transitions would extend off-site south of Finch Lane, off-site R.O.W. would be required to construct. The length of the turn lane is currently typically based on the storage, AASHTO deceleration, and taper.

PHR+A

The current AASHTO/VDOT desirable deceleration length for a 40 design speed (35 speed limit) is a 275 foot deceleration lane plus 140 foot taper. The transition at 40 mph design would be 320 feet in length, for a 12 foot lateral shift.

CONCLUSIONS

The existing and future conditions do not warrant a separate right turn lane and left turn lane on Rogues Road at Finch Lane. If Finch Lane were to remain open with future Master Planned development at Vint Hill, PHR+A would expect that VDOT would suggest separate left and right turn lanes on Rogues Road, similar to the improvements at Watson Road, to the north. However, with the adequate LOS during the peaks, additional growth can be accommodated with the existing infrastructure.

Please contact our office if you require additional information.

Respectfully Submitted,
PATTON HARRIS RUST & ASSOCIATES, INC.

Douglas R. Kennedy, P.E.
Vice President
Director of Transportation Planning
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Enclosure: Figures 1 - 9
Tables 3, 4

cc: Bobby Mangalath – PHR+A
Fred D. Ameen – PHR+A

Table 3
Finch Lane
Traffic Volume Comparison

Peak Hour Link Traffic Volumes on Finch Lane West of Rogues Rd

PHR+A 2008 Vs 1999 Link Traffic Volumes

Year		AM PEAK LINK Traffic (1)	Average Growth 2008-2005	2005-1999	2008-1999	Year		PM PEAK LINK Traffic (1)	Average Growth 2008-2005	2005-1999	2008-1999
2008	(2)	219	25.8%			2008	(2)	209	13.2%		
2005	(3)	110		-0.9%		2005	(3)	144		-5.2%	
1999	(4)	116			7.3%	1999	(4)	199			0.5%

Notes: (1) Peak Hour Finch Lane Link Traffic Volumes
(2) Source: PHR+A November 2008 Traffic Counts at Finch Lane (Rte-652) And Rogues Rd (Rte-602) Intersection
(3) Source: MCV 2005 Traffic Counts at Rogues Road
(4) Source: PHR+A April 1999 Traffic Counts at Finch Lane(Rte 652) and Rogues Rd (Route 602) intersection

Peak Hour Intersection Traffic Volumes on Finch Lane Rogues Rd (Route 602)

Growth 2008-1999

Year		AM PEAK Traffic (1)	Average Growth 2008-2005	2005-1999	2008-1999	Year		PM PEAK Traffic (1)	Average Growth 2008-2005	2005-1999	2008-1999
2008	(2)	504	14.6%			2008	(2)	536	12.8%		
2005	(3)	335		6.0%		2005	(3)	373		1.5%	
1999	(4)	236			8.8%	1999	(4)	342			5.1%

Notes: (1) Peak Hour Finch Lane Intersection Traffic Volumes
(2) Source: PHR+A November 2008 Traffic Counts at Finch Lane (Rte-652) And Rogues Rd (Rte-602) Intersection
(3) Source: MCV 2005 Traffic Counts at Rogues Road
(4) Source: PHR+A April 1999 Traffic Counts at Finch Lane(Rte 652) and Rogues Rd (Route 602) intersection

Table 4
Trip Generation Summary

ITE Land Use (1) CODE	CODE	DENSITY	Var.	USE	AM PEAK HOUR IN	AM PEAK HOUR OUT	AM PEAK HOUR TOTAL	PM PEAK HOUR IN	PM PEAK HOUR OUT	PM PEAK HOUR TOTAL	DAILY (2-way)
Proposed Site Plan Uses											
Site I											
710	710.730	15.000	ksf	Office @ 15,000 gsf	36	5	41	16	80	96	310
Site II											
710	710.740	24.000	ksf	Office @ 36,000 gsf	48	7	55	13	66	79	405
150	150.000	12.000	ksf	Warehouse	3	1	4	1	3	4	43
150	151.000	12.000	ksf	Warehouse (Generator)	3	2	5	1	4	5	43
Site III											
710	710.732	4.702	ksf	Office @ 9,309 gsf	12	2	14	8	37	45	108
150	150.000	4.607	ksf	Warehouse	1	0	1	0	1	1	16
150	151.000	4.607	ksf	Warehouse (Generator)	1	1	2	0	2	2	16
				Site Trips, Peak Hour	100	15	115	38	187	225	882
				Site Trips, Peak Hour Generator				38	189	227	

ITE Land Use (1) CODE	CODE	DENSITY	Var.	USE	SAT PEAK HOUR IN	SAT PEAK HOUR OUT	SAT PEAK HOUR TOTAL	DAILY (2-way)
710	710.731	15.000	ksf	Office @ 15,000 gsf(Sat)	4	4	8	310
710	710.741	24.000	ksf	Office @ 36,000 gsf(Sat)	6	5	11	405
710	710.732	4.702	ksf	Office @ 9,309 gsf(Sat)	2	1	3	108
150	150.200	16.607	ksf	Warehouse(Sat)	1	1	2	20
				Sat. Site Trips, Peak Hour	13	11	24	

ITE Land Use (1) CODE	CODE	DENSITY	Var.	VDOT 527 Check Site Plan
710	710.73	15	ksf	Office @ 15,000 gsf
710	710.74	24.000	ksf	Office @ 36,000 gsf
710	710.73	4.702	ksf	Office @ 9,309 gsf
150	150.00	16.607	ksf	Warehouse

Peak Hour Of Use, No Adjustments		
Peak hr of Street, no adj.	225	882
Peak hr of Generator	7	59
Saturday Generator	24	
Ex. Uses, no counts	0	0
Net Trips	225	882
Mixed Use Threshold for Rezoning/Site Plan	**250**	**2,500**
527 Required?	**NO**	**NO**

Effective Trip Rates (2)			AM Peak Hour (2-way)	AM Peak Hour %	PM Peak Hour (2-way)	PM Peak Hour %	Daily (2-way)
710	Office Average	ksf	2.52	87%	5.03	17%	18.83
710	Office @ 15,000 gsf	ksf	2.73	88%	6.40	17%	20.67
710	Office @ 36,000 gsf	ksf	2.29	87%	3.29	16%	16.88
710	Office @ 9,309 gsf	ksf	2.98	86%	9.57	18%	22.97
150	Warehouse	ksf	0.22	100%	0.22	0%	3.47
150	Warehouse (Generator)	ksf	0.43	50%	0.43	0%	3.47

TRIP RATE SOURCE:

Trip Generation Manual (8th Edition), Institute of Transportation Engineers; 2008.

Average trip rates used, unless noted with * then equations used

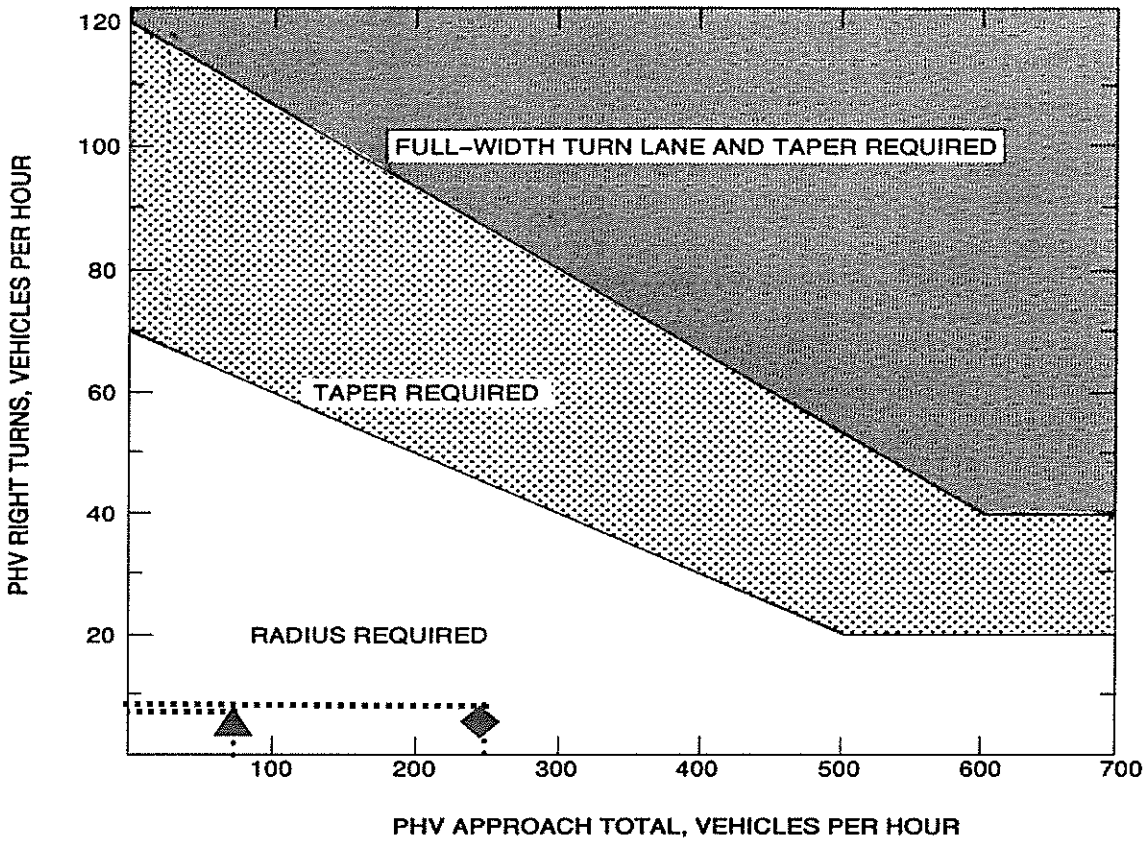
(1) ITE Land Code shown as the first 3 digits. Decimal shown for internal use by PHR+A for lookup table for trip rate variable.

(2) Efective trip rates calculated by land use:

For average rates = Density * ave. trip rate = 2-way Trips ; * inbound percentage for Trips In

For ITE equations = Density * trip equation = 2-way Trips ; * inbound percentage for Trips In

Existing(2008) SB Right Turn Warrant @ Finch Lane / Rogues Road



Peak Hour:	AM ▲	PM ◆
Rogues Road Southbound Approach:	083 VPH	252 VPH
Right Turns	8 VPH	9 VPH
% Right Turns	9.6%	3.6%

Figure Source: VDOT Road Design Manual, Calculations by PHR+A

Right Turn Lane Warrant - Not Satisfied

LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

For posted speeds at or under 70 km/h (45 mph), PHV right turns > 40, and PHV total < 300.
Adjusted right turns - PHV Right Turns - 20
If PHV is not known use formula: PHV = ADT x K x D

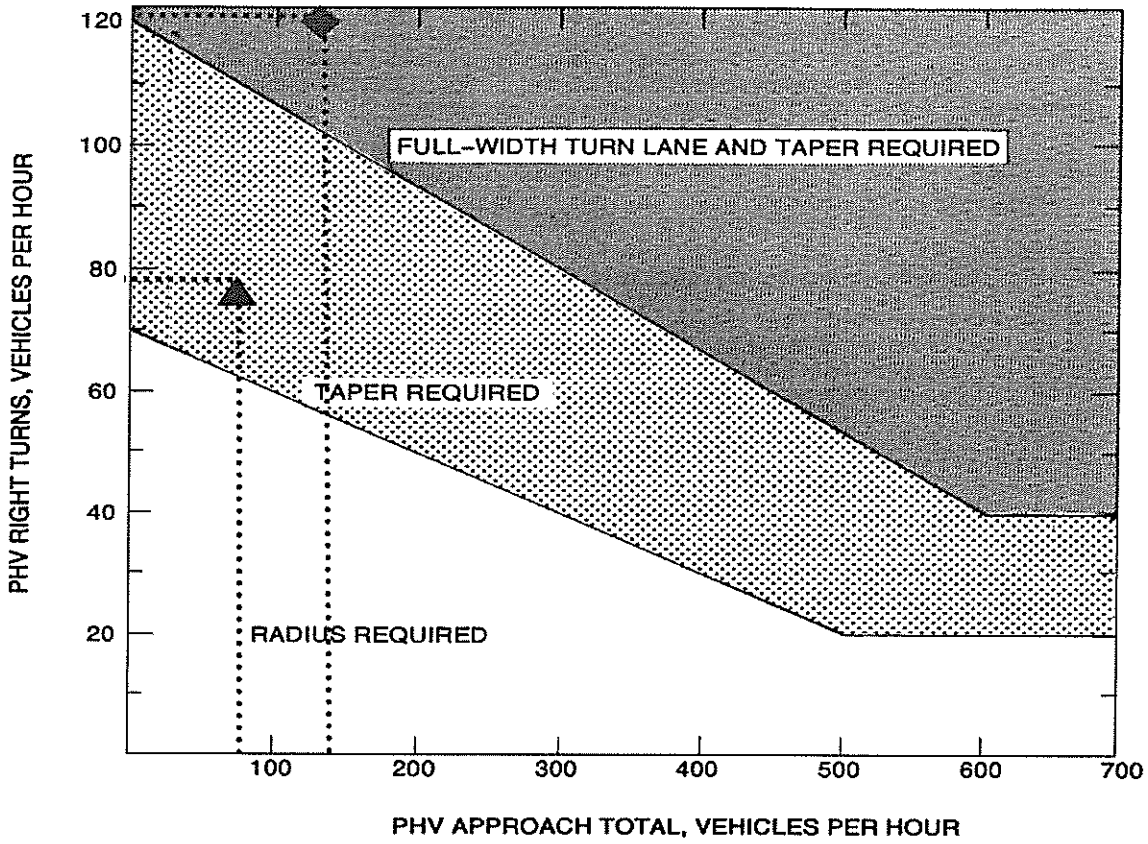
K = the percent of AADT occurring in the peak hour
D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

FIGURE C-1-8 GUIDELINES FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

Figure 2

Existing(2008)EB Right Turn Warrant @ Finch Lane / Rogues Road



Peak Hour:	AM ▲	PM ◆
Finch Lane Eastbound Approach:	080 VPH	134 VPH
Right Turns	79 VPH	124 VPH
% Right Turns	98.8%	92.5%

Figure Source: VDOT Road Design Manual, Calculations by PHR+A

Right Turn Lane Warrant - Satisfied

LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

For posted speeds at or under 70 km/h (45 mph), PHV right turns > 40, and PHV total < 300.
Adjusted right turns - PHV Right Turns - 20
If PHV is not known use formula: PHV = ADT x K x D

K = the percent of AADT occurring in the peak hour
D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

FIGURE C-1-8 GUIDELINES FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

Figure 3
Existing(2008) NB Rogues Road- Left Turn Warrant_AM

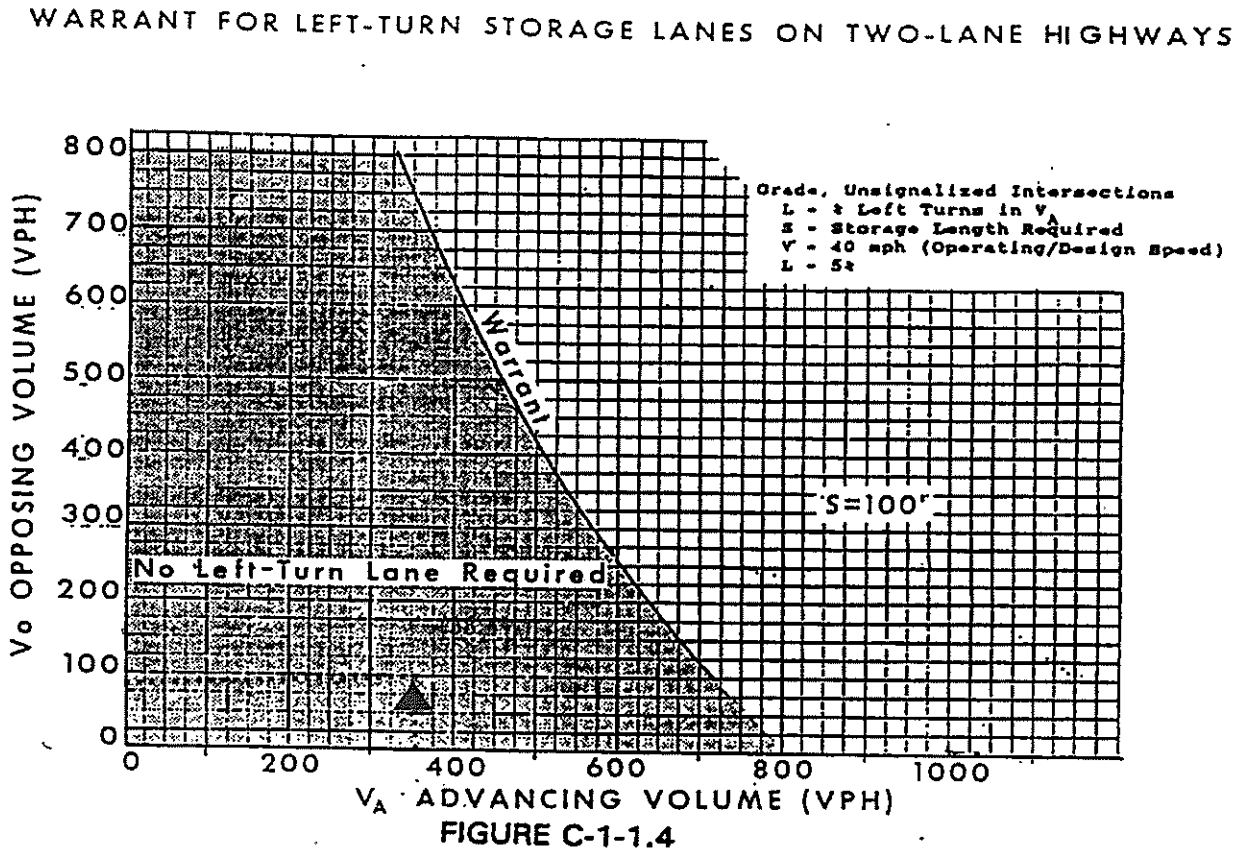


FIGURE C-1-1.4

Northbound:	**341 VPH**	
Left turns:	**131 VPH**	
% Left Turns	**38.42%**	**Peak Hour:**
Southbound Opposing Volume:	**83 VPH**	**AM**

Left Turn Storage Lane Warrant - Not Satisfied

Intersection of Rogues Road and Finch Lane

Figure 4
Existing (2008) NB-Rogues Road Left Turn Warrant_PM

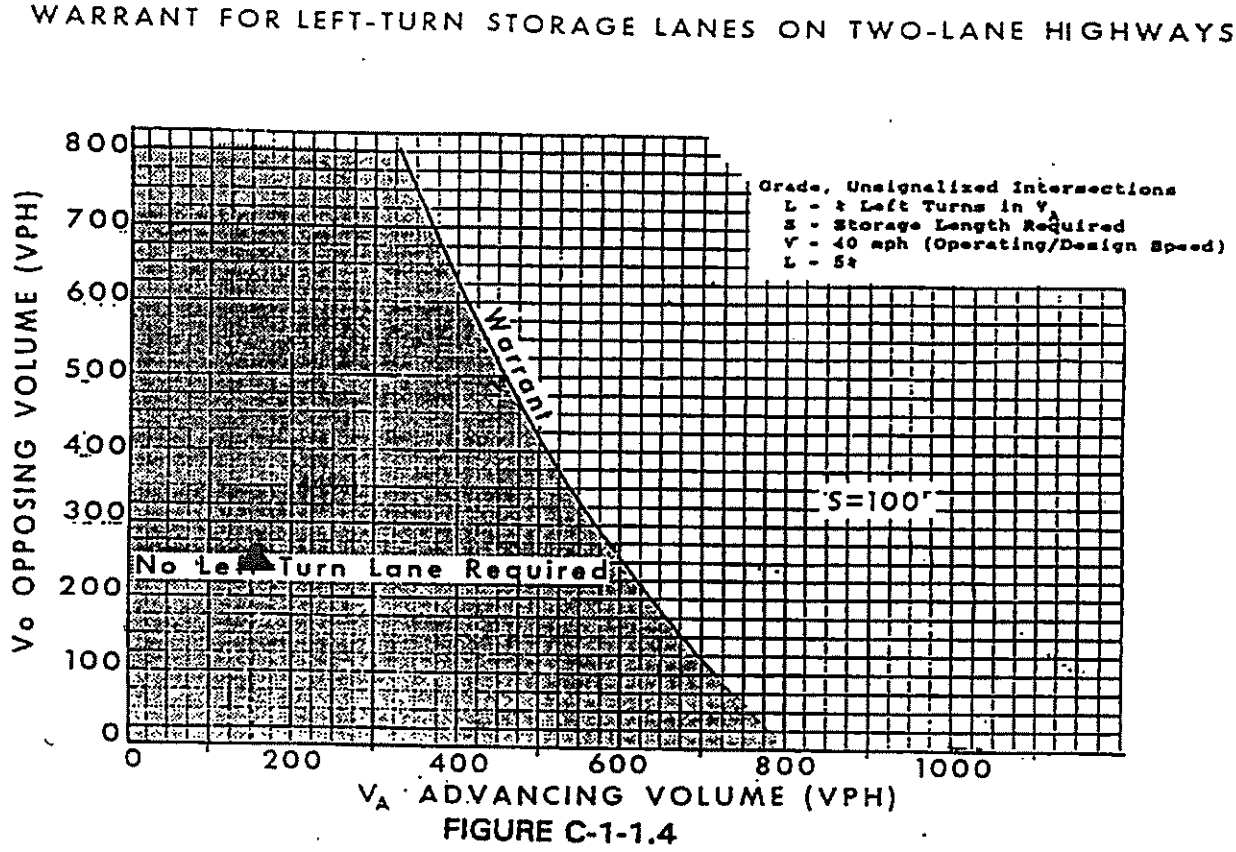
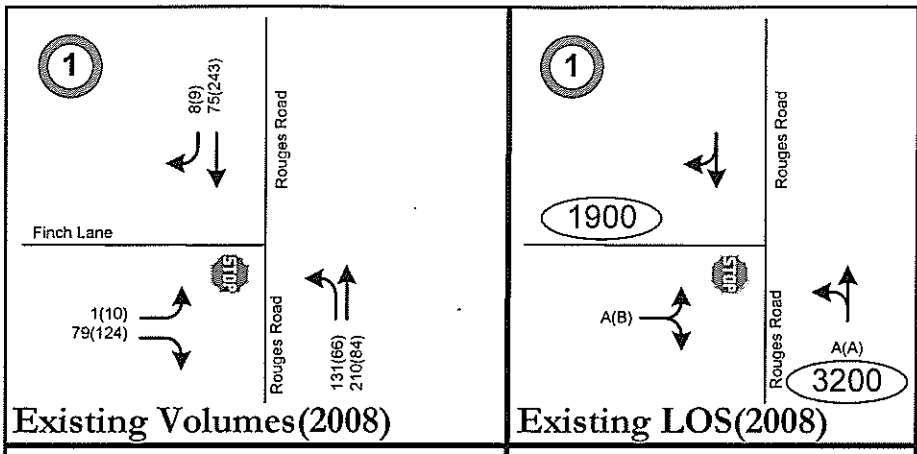


FIGURE C-1-1.4

Northbound:	**150 VPH**	
Left turns:	**66 VPH**	
% Left Turns	**44.00%**	**Peak Hour:**
Southbound Opposing Volume:	**252 VPH**	**PM**

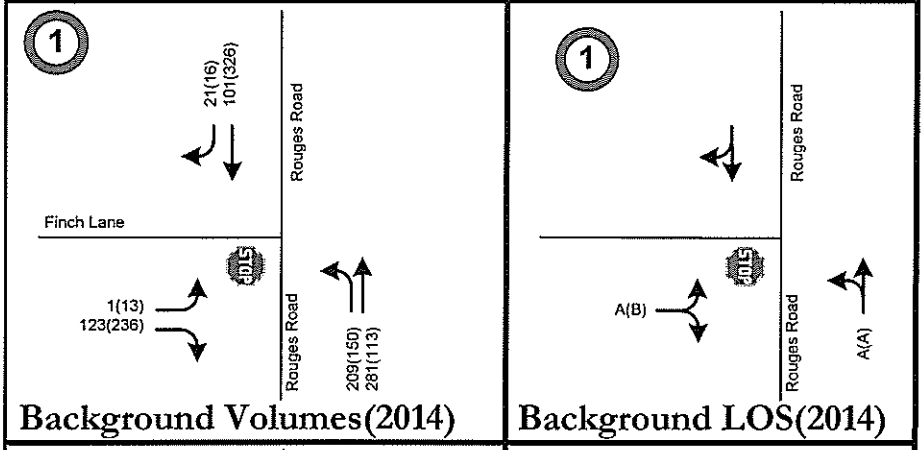
Left Turn Storage Lane Warrant - Not Satisfied

Intersection of Rogues Road and Finch Lane



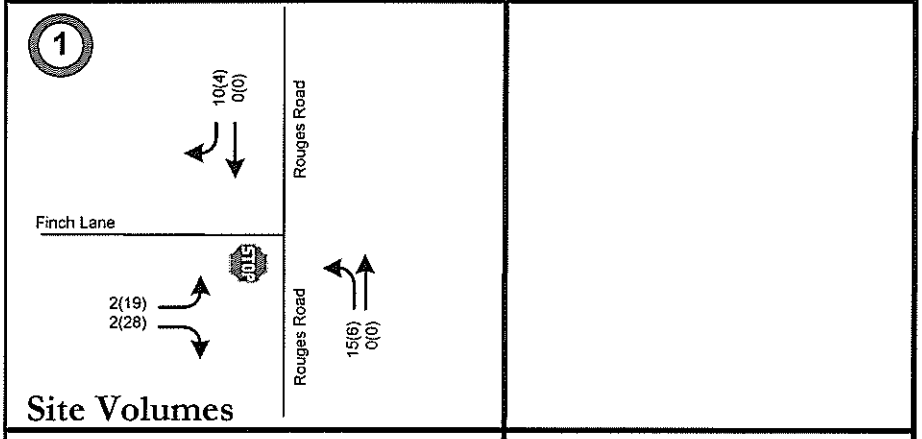
Existing Volumes(2008)

Existing LOS(2008)

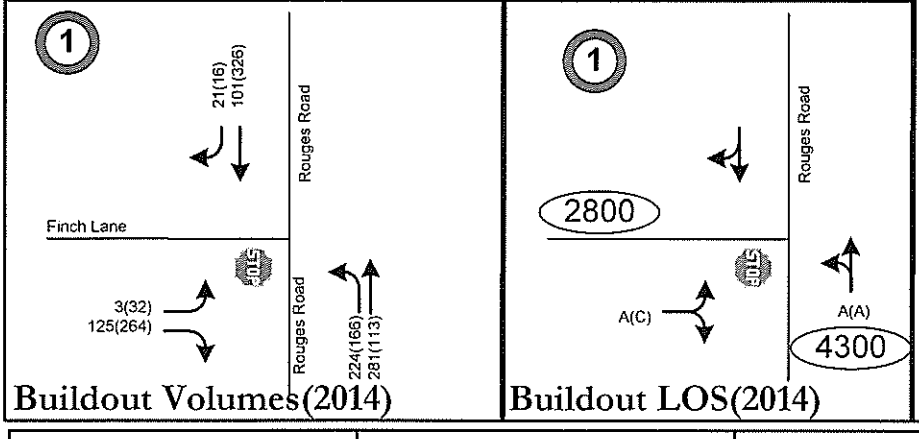


Background Volumes(2014)

Background LOS(2014)

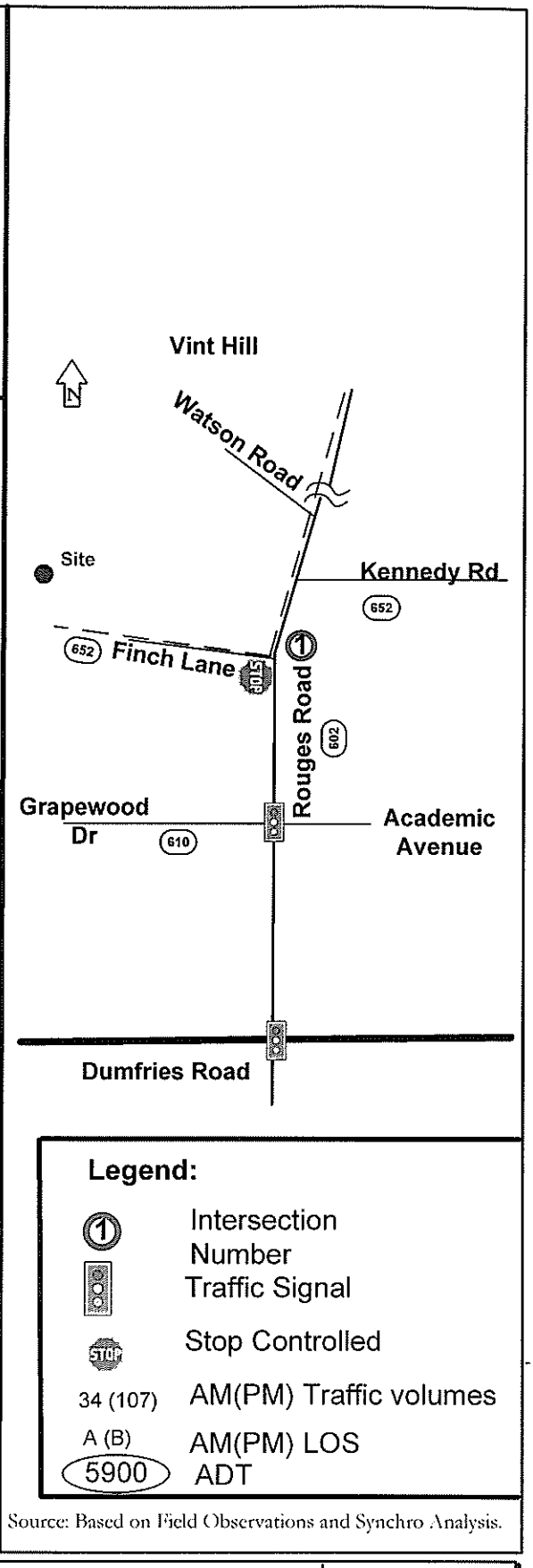


Site Volumes



Buildout Volumes(2014)

Buildout LOS(2014)

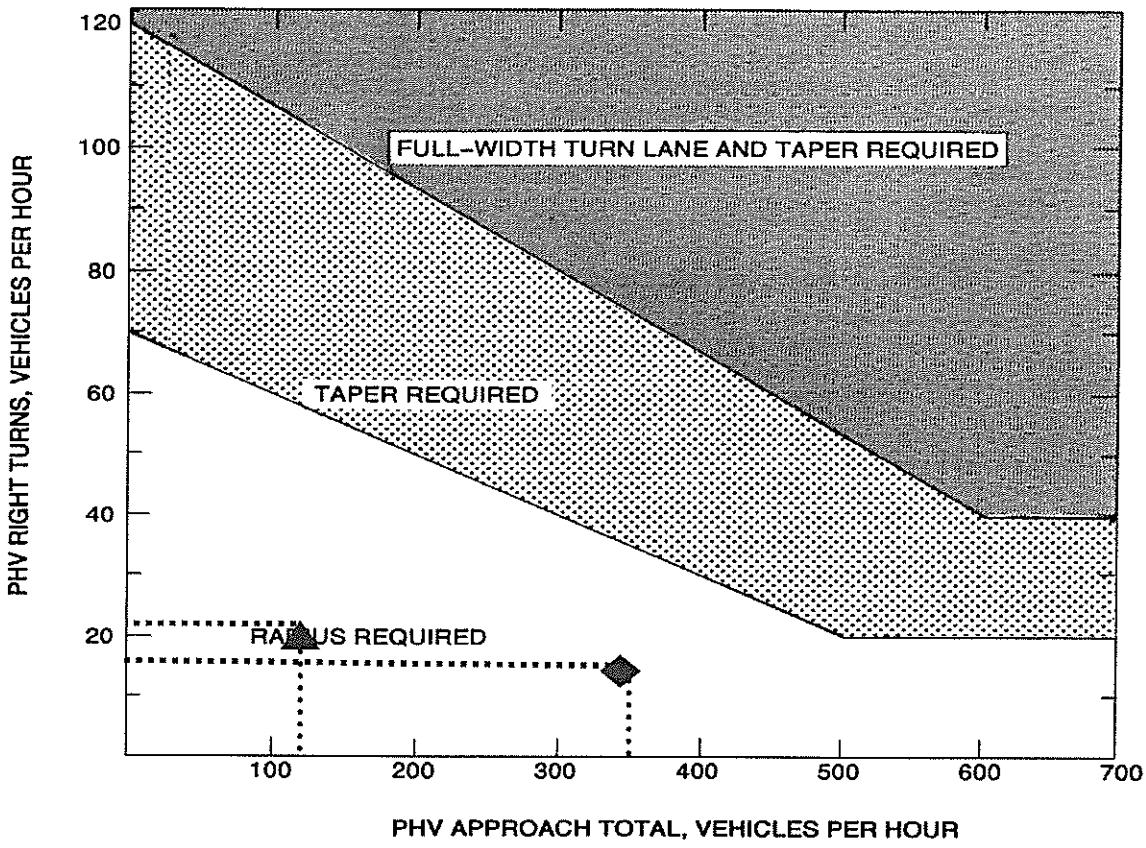


Source: Based on Field Observations and Synchro Analysis.

PHR+A	Finch Lane Office Traffic Impact Study	Volumes/Level of Service Turning Movements *March, 2009*	Figure 5 *10428-E-9*

Figure 6

Build-Out(2014) SB Right Turn Warrant @ Finch Lane / Rogues Road



Peak Hour:	AM ▲	PM ◆
Rogues Road Southbound Approach:	122 VPH	342 VPH
Right Turns	21 VPH	16 VPH
% Right Turns	17.2%	4.7%

Figure Source: VDOT Road Design Manual, Calculations by PHR+A

Right Turn Lane Warrant - Not Satisfied

LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

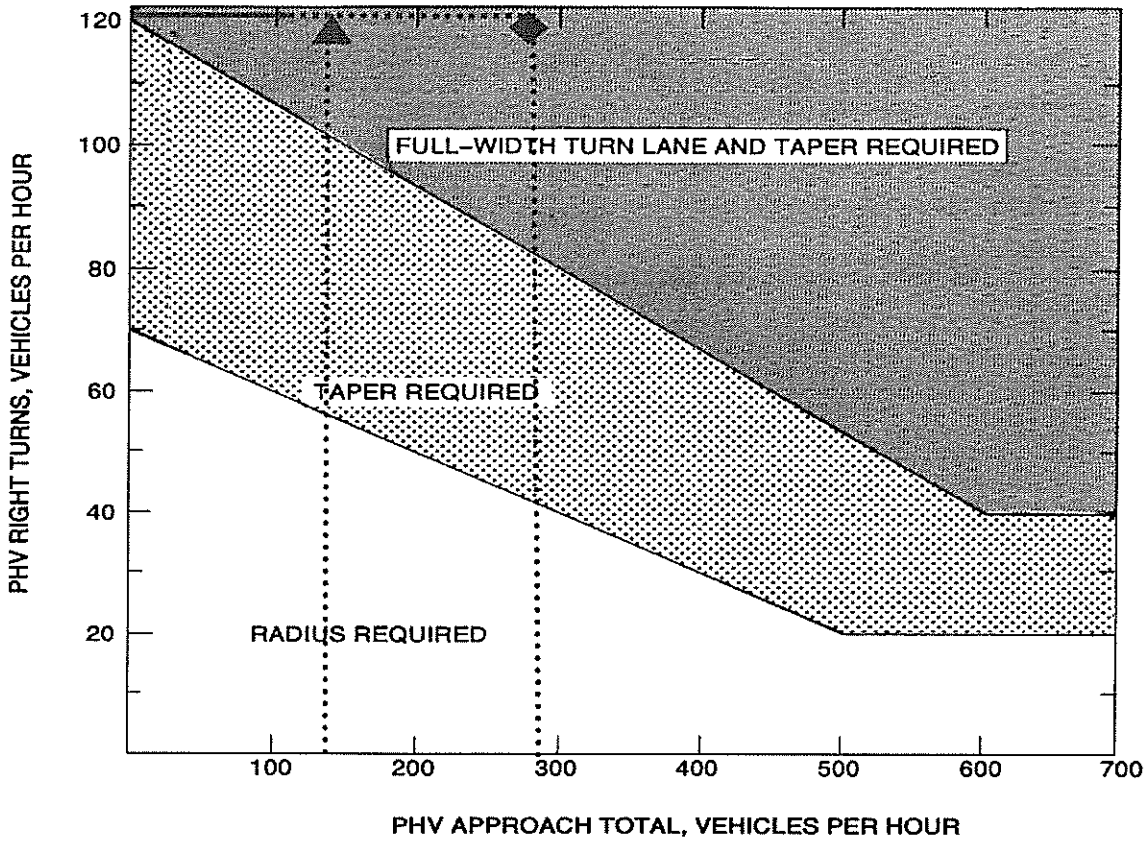
For posted speeds at or under 70 km/h (45 mph), PHV right turns > 40, and PHV total < 300.
Adjusted right turns - PHV Right Turns - 20
If PHV is not known use formula: PHV = ADT x K x D

K = the percent of AADT occurring in the peak hour
D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

FIGURE C-1-8 GUIDELINES FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

Figure 7
Build-Out(2014)EB Right Turn Warrant @ Finch Lane / Rogues Road



Peak Hour:	AM ▲	PM ◆
Finch Lane Eastbound Approach:	128 VPH	296 VPH
Right Turns	125 VPH	264 VPH
% Right Turns	97.7%	89.2%

Figure Source: VDOT Road Design Manual, Calculations by PHR+A

Right Turn Lane Warrant - Satisfied

LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

For posted speeds at or under 70 km/h (45 mph), PHV right turns > 40, and PHV total < 300.
Adjusted right turns - PHV Right Turns - 20
If PHV is not known use formula: PHV = ADT x K x D

K = the percent of AADT occurring in the peak hour
D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

FIGURE C-1-8 GUIDELINES FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

Figure 8
Build-Out(2014) NB Rogues Road Left Turn Warrant_AM

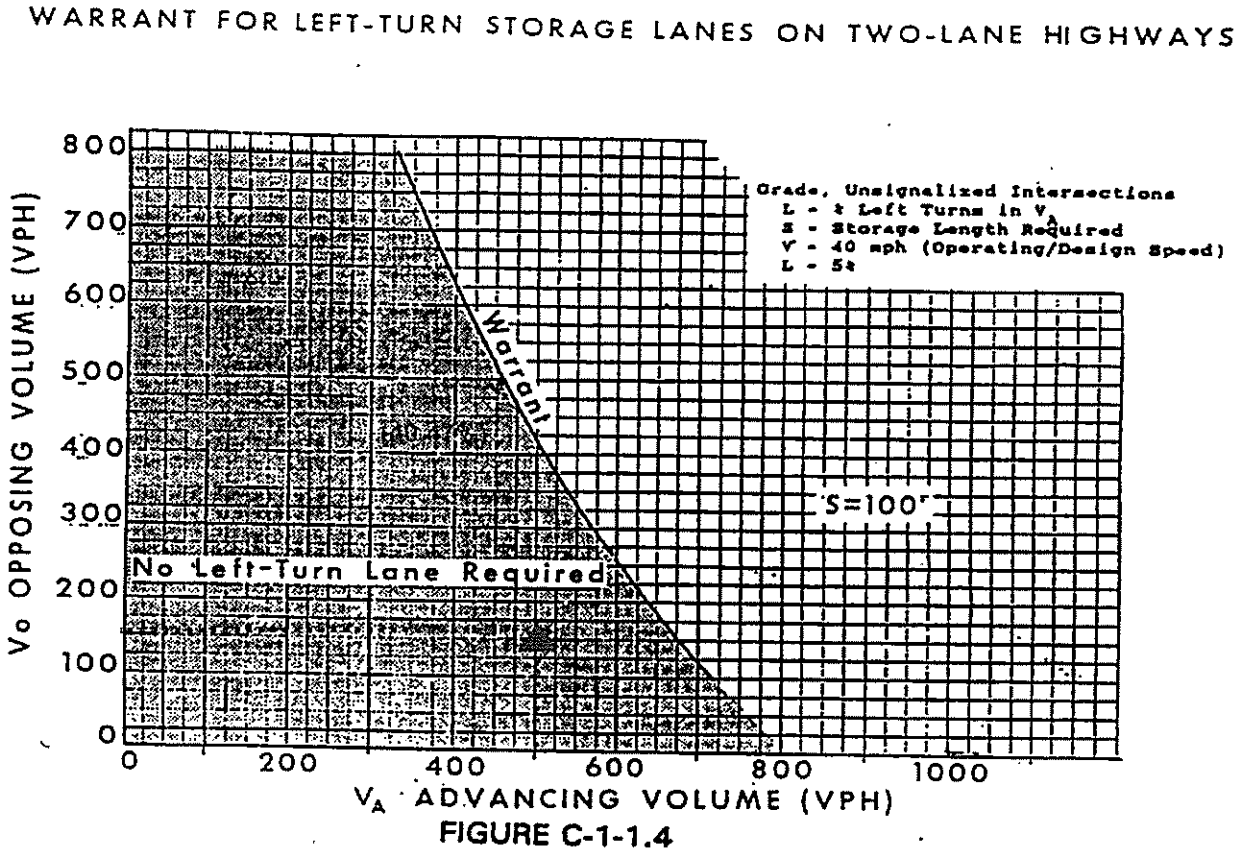


FIGURE C-1-1.4

Northbound:	**505 VPH**	
Left turns:	**224 VPH**	
% Left Turns	**44.36%**	**Peak Hour:**
Southbound Opposing Volume:	**122 VPH**	**AM**

Left Turn Storage Lane Warrant - Not Satisfied

Intersection of Rogues Road and Finch Lane

Figure 9
Build-Out(2014) NB Rogues Road Left Turn Warrant_PM

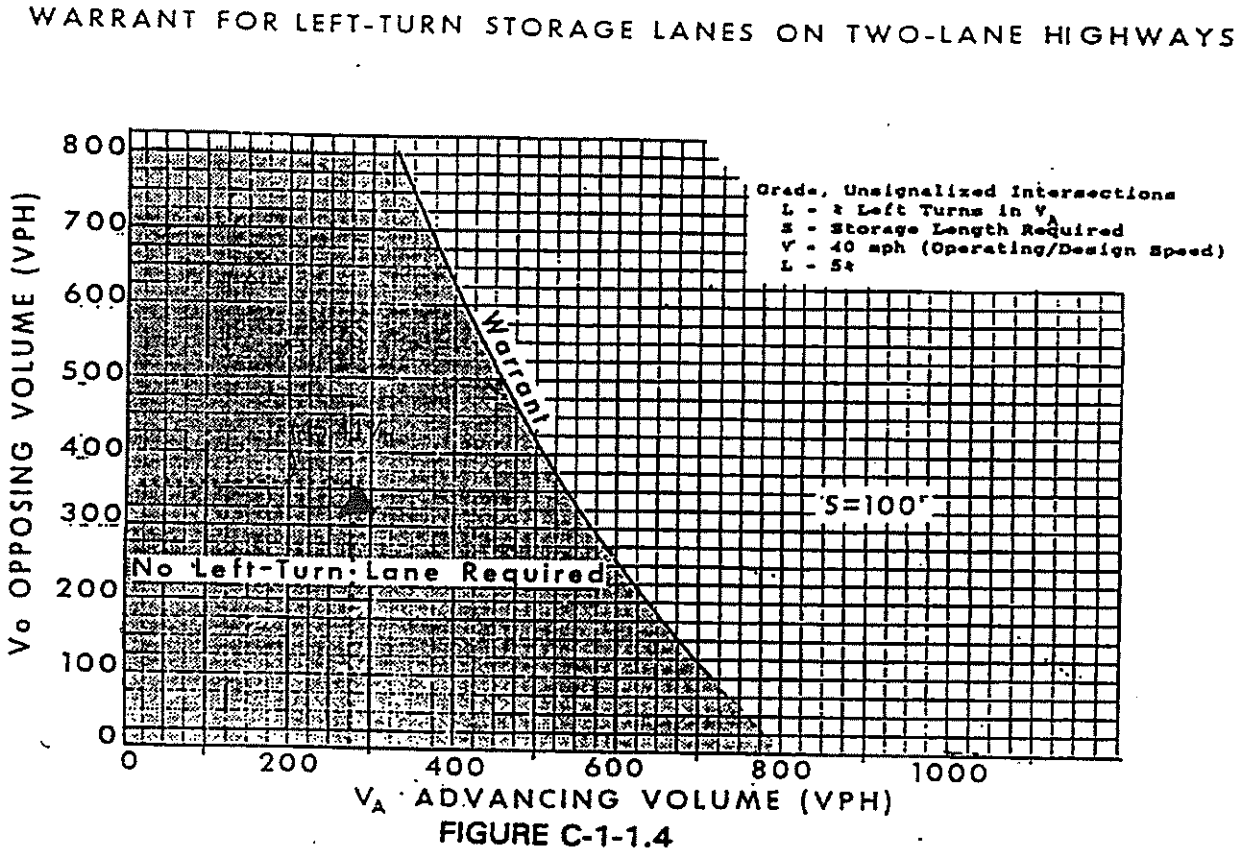


FIGURE C-1-1.4

Northbound:	**279 VPH**	
Left turns:	**166 VPH**	
% Left Turns	**59.50%**	**Peak Hour:**
Southbound Opposing Volume:	**342 VPH**	**PM**

Left Turn Storage Lane Warrant - Not Satisfied

Intersection of Rogues Road and Finch Lane

APPENDIX A

Traffic and Tube Counts

PHR+A TRAFFIC COUNT SUMMARY

Faquier School F-10428-E-9

E/W Street: Finch Lane
N/S Street: Rogues Road
Location: High School, Faquier County

Source: PHR+A
Date: November 13, 2008
Name: Bobby Mangalath

AM 15 Minute Traffic Volumes

	Rogues Road Southbound				Rogues Road Northbound				Finch Lane Westbound				Finch Lane Eastbound				Intersection
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
6:45 - 7:00 AM	0	12	0	12	19	45	0	64	0	0	0	0	0	7	0	7	83
7:00 - 7:15 AM	0	27	4	31	44	35	0	79	0	0	0	0	0	39	0	39	149
7:15 - 7:30 AM	0	21	1	22	45	75	0	120	0	0	0	0	1	28	0	29	171
7:30 - 7:45 AM	0	14	2	16	19	46	0	65	0	0	0	0	0	5	0	5	86
7:45 - 8:00 AM	0	13	1	14	23	54	0	77	0	0	0	0	0	7	0	7	98
8:00 - 8:15 AM	0	13	1	14	13	28	0	41	0	0	0	0	1	8	0	9	64
8:15 - 8:30 AM	0	22	3	25	19	32	0	51	0	0	0	0	0	8	0	8	84
8:30 - 8:45 AM	0	31	1	32	29	48	0	77	0	0	0	0	2	4	0	6	115
8:45 - 9:00 AM	0	18	2	20	14	25	0	39	0	0	0	0	1	8	0	9	68
9:00 - 9:15 AM	0	12	3	15	19	16	0	35	0	0	0	0	0	7	0	7	57
AM Peak 15 Minute Traffic Volume																	
7:15 - 7:30 AM	0	21	1	22	45	75	0	120	0	0	0	0	1	28	0	29	171

AM Hourly Traffic Volumes

	Rogues Road Southbound				Rogues Road Northbound				Finch Lane Westbound				Finch Lane Eastbound				Intersection
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
6:45 - 7:45 AM	0	74	7	81	127	201	0	328	0	0	0	0	1	79	0	80	489
7:00 - 8:00 AM	0	75	8	83	131	210	0	341	0	0	0	0	1	79	0	80	504
7:15 - 8:15 AM	0	61	5	66	100	203	0	303	0	0	0	0	2	48	0	50	419
7:30 - 8:30 AM	0	62	7	69	74	160	0	234	0	0	0	0	1	28	0	29	332
7:45 - 8:45 AM	0	79	6	85	84	162	0	246	0	0	0	0	3	27	0	30	361
8:00 - 9:00 AM	0	84	7	91	75	133	0	208	0	0	0	0	4	28	0	32	331
8:15 - 9:15 AM	0	83	9	92	81	121	0	202	0	0	0	0	3	27	0	30	324
8:30 - 9:30 AM	0	61	6	67	62	89	0	151	0	0	0	0	3	19	0	22	240
8:45 - 9:45 AM	0	30	5	35	33	41	0	74	0	0	0	0	1	15	0	16	125
9:00 - 10:00 AM	0	12	3	15	19	16	0	35	0	0	0	0	0	7	0	7	57
AM Peak Hour Traffic Volume																	
7:00 - 8:00 AM	**0**	**75**	**8**	**83**	**131**	**210**	**0**	**341**	**0**	**0**	**0**	**0**	**1**	**79**	**0**	**80**	**504**
AM Peak Hour Factors				***0.94***				***0.71***				***#DIV/0!***				***0.69***	***0.74***

PHR+A TRAFFIC COUNT SUMMARY

Faquier School F-10428-E-9

E/W Street: Finch Lane
N/S Street: Rogues Street
Location: High School, Faquier County

Source: PHR+A
Date: November 12, 2008
Name: Bobby Mangalath

PM 15 Minute Traffic Volumes

	Rogues Street Southbound				Rogues Street Northbound				Finch Lane Westbound				Finch Lane Eastbound				Intersection
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
4:00 - 4:15 PM	0	39	0	39	4	16	0	20	0	0	0	0	2	27	0	29	88
4:15 - 4:30 PM	0	60	0	60	14	23	0	37	0	0	0	0	4	21	0	25	122
4:30 - 4:45 PM	0	52	2	54	9	13	0	22	0	0	0	0	3	29	0	32	108
4:45 - 5:00 PM	0	51	2	53	22	26	0	48	0	0	0	0	3	35	0	38	139
5:00 - 5:15 PM	0	60	2	62	17	16	0	33	0	0	0	0	3	38	0	41	136
5:15 - 5:30 PM	0	75	2	77	13	20	0	33	0	0	0	0	1	30	0	31	141
5:30 - 5:45 PM	0	57	3	60	14	22	0	36	0	0	0	0	3	21	0	24	120
5:45 - 6:00 PM	0	55	0	55	13	17	0	30	0	0	0	0	4	29	0	33	118
6:00 - 6:15 PM	0	53	1	54	11	10	0	21	0	0	0	0	0	25	0	25	100
6:15 - 6:30 PM	0	40	1	41	13	17	0	30	0	0	0	0	0	19	0	19	90
PM Peak 15 Minute Traffic Volume																	
5:15 - 5:30 PM	0	75	2	77	13	20	0	33	0	0	0	0	1	30	0	31	141

PM Hourly Traffic Volumes

	Rogues Street Southbound				Rogues Street Northbound				Finch Lane Westbound				Finch Lane Eastbound				Intersection
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
4:00 - 5:00 PM	0	202	4	206	49	78	0	127	0	0	0	0	12	112	0	124	457
4:15 - 5:15 PM	0	223	6	229	62	78	0	140	0	0	0	0	13	123	0	136	505
4:30 - 5:30 PM	0	238	8	246	61	75	0	136	0	0	0	0	10	132	0	142	524
4:45 - 5:45 PM	0	243	9	252	66	84	0	150	0	0	0	0	10	124	0	134	536
5:00 - 6:00 PM	0	247	7	254	57	75	0	132	0	0	0	0	11	118	0	129	515
5:15 - 6:15 PM	0	240	6	246	51	69	0	120	0	0	0	0	8	105	0	113	479
5:30 - 6:30 PM	0	205	5	210	51	66	0	117	0	0	0	0	7	94	0	101	428
5:45 - 6:45 PM	0	148	2	150	37	44	0	81	0	0	0	0	4	73	0	77	308
6:00 - 7:00 PM	0	93	2	95	24	27	0	51	0	0	0	0	0	44	0	44	190
6:15 - 7:15 PM	0	40	1	41	13	17	0	30	0	0	0	0	0	19	0	19	90
PM Peak Hour Traffic Volume																	
4:45 - 5:45 PM	**0**	**243**	**9**	**252**	**66**	**84**	**0**	**150**	**0**	**0**	**0**	**0**	**10**	**124**	**0**	**134**	**536**
PM Peak Hour Factors				***0.82***				***1.14***				***#DIV/0!***				***1.08***	***0.95***

PHR+A TRAFFIC COUNT SUMMARY

Faquier School F-10428-E-9

E/W Street: Grapewood Dr/ Academic Avenue
N/S Street: Rogues Road
Location: High School, Faquier County

Source: PHR+A
Date: December 4, 2008
Name: Bobby Mangalath

AM 15 Minute Traffic Volumes

	Rogues Road Southbound				Rogues Road Northbound				Grapewood Dr/ Academic Aven Westbound				Grapewood Dr/ Academic Avenu Eastbound				Intersection
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
6:45 - 7:00 AM	21	3	2	26	1	38	45	84	9	1	8	18	1	1	2	4	132
7:00 - 7:15 AM	52	14	1	67	2	57	85	144	41	1	35	77	4	6	4	14	302
7:15 - 7:30 AM	26	12	2	40	0	65	47	112	25	2	39	66	2	3	3	8	226
7:30 - 7:45 AM	3	22	1	26	2	41	15	58	4	0	7	11	5	1	3	9	104
7:45 - 8:00 AM	4	11	0	15	0	70	19	89	3	0	2	5	1	0	1	2	111
8:00 - 8:15 AM	9	12	1	22	0	43	27	70	5	0	1	6	6	0	1	7	105
8:15 - 8:30 AM	22	10	0	32	3	43	38	84	19	1	24	44	2	1	3	6	166
8:30 - 8:45 AM	13	16	0	29	4	34	40	78	42	0	26	68	2	3	3	8	183
8:45 - 9:00 AM	3	17	0	20	1	41	2	44	6	1	2	9	3	0	4	7	80
9:00 - 9:15 AM	1	13	0	14	0	29	2	31	4	0	1	5	4	1	1	6	56
AM Peak 15 Minute Traffic Volume																	
7:00 - 7:15 AM	52	14	1	67	2	57	85	144	41	1	35	77	4	6	4	14	302

AM Hourly Traffic Volumes

	Rogues Road Southbound				Rogues Road Northbound				Grapewood Dr/ Academic Aven Westbound				Grapewood Dr/ Academic Avenu Eastbound				Intersection
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
6:45 - 7:45 AM	102	51	6	159	5	201	192	398	79	4	89	172	12	11	12	35	764
7:00 - 8:00 AM	85	59	4	148	4	233	166	403	73	3	83	159	12	10	11	33	743
7:15 - 8:15 AM	42	57	4	103	2	219	108	329	37	2	49	88	14	4	8	26	546
7:30 - 8:30 AM	38	55	2	95	5	197	99	301	31	1	34	66	14	2	8	24	486
7:45 - 8:45 AM	48	49	1	98	7	190	124	321	69	1	53	123	11	4	8	23	565
8:00 - 9:00 AM	47	55	1	103	8	161	107	276	72	2	53	127	13	4	11	28	534
8:15 - 9:15 AM	39	56	0	95	8	147	82	237	71	2	53	126	11	5	11	27	485
8:30 - 9:30 AM	17	46	0	63	5	104	44	153	52	1	29	82	9	4	8	21	319
8:45 - 9:45 AM	4	30	0	34	1	70	4	75	10	1	3	14	7	1	5	13	136
9:00 - 10:00 AM	1	13	0	14	0	29	2	31	4	0	1	5	4	1	1	6	56
AM Peak Hour Traffic Volume																	
6:45 - 7:45 AM	**102**	**51**	**6**	**159**	**5**	**201**	**192**	**398**	**79**	**4**	**89**	**172**	**12**	**11**	**12**	**35**	**764**
AM Peak Hour Factors				***0.59***				***0.69***				***0.56***				***0.63***	***0.63***

PHR+A TRAFFIC COUNT SUMMARY

Faquier School F-10428-E-9

E/W Street: Grapewood Dr/ Academic Avenue
N/S Street: Rogues Road
Location: High School, Faquier County

Source: PHR+A
Date: December 4, 2008
Name: Bobby Mangalath

PM 15 Minute Traffic Volumes

	Rogues Road Southbound				Rogues Road Northbound				Grapewood Dr/ Academic Aven Westbound				Grapewood Dr/ Academic Avenu Eastbound				Intersection
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
4:00 - 4:15 PM	5	60	3	68	3	14	12	29	19	1	14	34	0	0	2	2	133
4:15 - 4:30 PM	8	66	4	78	0	25	11	36	20	0	6	26	3	1	1	5	145
4:30 - 4:45 PM	9	65	5	79	5	21	19	45	18	1	15	34	3	1	3	7	165
4:45 - 5:00 PM	13	63	6	82	5	31	13	49	22	1	18	41	2	0	3	5	177
5:00 - 5:15 PM	11	93	5	109	5	20	7	32	16	1	11	28	3	0	5	8	177
5:15 - 5:30 PM	11	84	4	99	2	26	8	36	8	1	4	13	0	2	2	4	152
5:30 - 5:45 PM	17	102	5	124	2	28	16	46	10	2	3	15	1	4	2	7	192
5:45 - 6:00 PM	6	71	7	84	4	32	13	49	12	3	14	29	2	0	4	6	168
6:00 - 6:15 PM	6	41	9	56	3	27	11	41	16	0	8	24	1	0	2	3	124
6:15 - 6:30 PM	2	36	3	41	1	21	10	32	6	0	1	7	0	0	3	3	83
PM Peak 15 Minute Traffic Volume																	
5:30 - 5:45 PM	17	102	5	124	2	28	16	46	10	2	3	15	1	4	2	7	192

PM Hourly Traffic Volumes

	Rogues Road Southbound				Rogues Road Northbound				Grapewood Dr/ Academic Aven Westbound				Grapewood Dr/ Academic Avenu Eastbound				Intersection
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Total
4:00 - 5:00 PM	35	254	18	307	13	91	55	159	79	3	53	135	8	2	9	19	620
4:15 - 5:15 PM	41	287	20	348	15	97	50	162	76	3	50	129	11	2	12	25	664
4:30 - 5:30 PM	44	305	20	369	17	98	47	162	64	4	48	116	8	3	13	24	671
4:45 - 5:45 PM	52	342	20	414	14	105	44	163	56	5	36	97	6	6	12	24	698
5:00 - 6:00 PM	45	350	21	416	13	106	44	163	46	7	32	85	6	6	13	25	689
5:15 - 6:15 PM	40	298	25	363	11	113	48	172	46	6	29	81	4	6	10	20	636
5:30 - 6:30 PM	31	250	24	305	10	108	50	168	44	5	26	75	4	4	11	19	567
5:45 - 6:45 PM	14	148	19	181	8	80	34	122	34	3	23	60	3	0	9	12	375
6:00 - 7:00 PM	8	77	12	97	4	48	21	73	22	0	9	31	1	0	5	6	207
6:15 - 7:15 PM	2	36	3	41	1	21	10	32	6	0	1	7	0	0	3	3	83
PM Peak Hour Traffic Volume																	
4:45 - 5:45 PM	**52**	**342**	**20**	**414**	**14**	**105**	**44**	**163**	**56**	**5**	**36**	**97**	**6**	**6**	**12**	**24**	**698**
PM Peak Hour Factors				***0.83***				***0.89***				***1.62***				***0.86***	***0.91***

JAMAR Technologies, Inc.

151 Keith Valley Rd.
Horsham, PA, USA 19044
800-776-0940

Site Code: FINCH WB EB
Station ID:

Latitude: 0' 0.000 South

Start Time	17-Nov- Mon	Direction 1 A.M.	Direction 1 P.M.	Direction 2 A.M.	Direction 2 P.M.	Combined A.M.	Combined P.M.	18-Nov- Tue	Direction 1 A.M.	Direction 1 P.M.	Direction 2 A.M.	Direction 2 P.M.	Combined A.M.	Combined P.M.
12:00		*	*	*	*	*	*		0	11	5	9	5	20
12:15		*	*	*	*	*	*		4	10	2	4	6	14
12:30		*	*	*	*	*	*		0	12	2	10	2	22
12:45		*	*	*	*	*	*		2	10	2	11	4	21
01:00		*	*	*	*	*	*		0	6	3	5	3	11
01:15		*	*	*	*	*	*		1	9	0	10	1	19
01:30		*	*	*	*	*	*		1	8	1	4	2	12
01:45		*	*	*	*	*	*		0	11	1	13	1	24
02:00		*	*	*	*	*	*		0	18	0	11	0	29
02:15		*	*	*	*	*	*		0	8	0	14	0	22
02:30		*	*	*	*	*	*		0	15	0	9	0	24
02:45		*	*	*	*	*	*		1	7	0	11	1	18
03:00		*	*	*	*	*	*		0	7	3	6	3	13
03:15		*	*	*	*	*	*		0	15	0	16	0	31
03:30		*	*	*	*	*	*		0	10	0	19	0	29
03:45		*	*	*	*	*	*		0	31	0	20	0	51
04:00		*	*	*	*	*	*		0	15	0	18	0	33
04:15		*	*	*	*	*	*		0	6	1	36	1	42
04:30		*	11	*	28	*	39		0	11	0	20	0	31
04:45		*	7	*	32	*	39		3	16	0	37	3	53
05:00		*	19	*	17	*	36		5	28	0	24	5	52
05:15		*	11	*	38	*	49		5	17	0	36	5	53
05:30		*	14	*	34	*	46		4	11	0	36	4	47
05:45		*	16	*	35	*	51		8	16	1	37	9	53
06:00		*	22	*	28	*	50		10	10	0	18	10	28
06:15		*	11	*	42	*	53		14	10	0	45	14	55
06:30		*	12	*	20	*	32		9	7	1	28	10	35
06:45		*	12	*	31	*	43		14	7	0	29	14	36
07:00		*	13	*	36	*	49		19	14	2	33	21	47
07:15		*	12	*	28	*	40		19	13	3	23	22	36
07:30		*	14	*	17	*	31		17	11	6	18	23	29
07:45		*	5	*	25	*	30		26	5	6	19	32	24
08:00		*	15	*	37	*	52		33	2	6	20	39	22
08:15		*	5	*	14	*	19		33	1	36	12	69	13
08:30		*	1	*	15	*	16		36	6	21	17	57	23
08:45		*	2	*	17	*	19		13	3	8	7	21	10
09:00		*	13	*	10	*	23		23	4	4	6	27	10
09:15		*	20	*	18	*	38		16	10	4	10	20	20
09:30		*	19	*	5	*	24		19	2	9	7	28	9
09:45		*	8	*	15	*	23		30	9	7	10	37	19
10:00		*	3	*	7	*	10		14	7	11	6	25	13
10:15		*	2	*	11	*	13		21	6	3	17	24	23
10:30		*	4	*	9	*	13		9	4	9	7	18	11
10:45		*	2	*	4	*	6		8	4	2	4	10	8
11:00		*	1	*	5	*	6		9	6	4	11	13	17
11:15		*	1	*	7	*	8		8	1	8	7	16	8
11:30		*	1	*	1	*	2		8	1	7	1	15	2
11:45		*	3	*	5	*	8		20	2	6	7	26	9
Total		0	279	0	591	0	870		462	453	184	778	646	1231
Day Total		279		591		870			915		962		1877	
% Total		0.0%	32.1%	0.0%	67.9%				24.6%	24.1%	9.8%	41.4%		
Peak			05:15		05:30		05:30		07:45	04:30	08:00	05:30	07:45	04:45
Vol.			63		139		202		128	72	71	136	197	205
P.H.F.			0.716		0.827		0.953		0.889	0.581	0.493	0.756	0.714	0.967

JAMAR Technologies, Inc.

151 Keith Valley Rd.
Horsham, PA, USA 19044
800-776-0940

Site Code: FINCH WB EB
Station ID:

Latitude: 0' 0.000 South

Start Time	19-Nov- Wed	Direction 1 A.M.	Direction 1 P.M.	Direction 2 A.M.	Direction 2 P.M.	Combined A.M.	Combined P.M.	20-Nov- Thu	Direction 1 A.M.	Direction 1 P.M.	Direction 2 A.M.	Direction 2 P.M.	Combined A.M.	Combined P.M.
12:00		2	*	3	*	5	*		*	*	*	*	*	*
12:15		2	*	4	*	6	*		*	*	*	*	*	*
12:30		0	*	5	*	5	*		*	*	*	*	*	*
12:45		1	*	1	*	2	*		*	*	*	*	*	*
01:00		0	*	3	*	3	*		*	*	*	*	*	*
01:15		1	*	1	*	2	*		*	*	*	*	*	*
01:30		0	*	3	*	3	*		*	*	*	*	*	*
01:45		0	*	3	*	3	*		*	*	*	*	*	*
02:00		0	*	0	*	0	*		*	*	*	*	*	*
02:15		0	*	0	*	0	*		*	*	*	*	*	*
02:30		0	*	1	*	1	*		*	*	*	*	*	*
02:45		0	*	0	*	0	*		*	*	*	*	*	*
03:00		0	*	0	*	0	*		*	*	*	*	*	*
03:15		0	*	0	*	0	*		*	*	*	*	*	*
03:30		0	*	0	*	0	*		*	*	*	*	*	*
03:45		0	*	1	*	1	*		*	*	*	*	*	*
04:00		0	*	0	*	0	*		*	*	*	*	*	*
04:15		0	*	0	*	0	*		*	*	*	*	*	*
04:30		0	*	0	*	0	*		*	*	*	*	*	*
04:45		3	*	0	*	3	*		*	*	*	*	*	*
05:00		1	*	0	*	1	*		*	*	*	*	*	*
05:15		6	*	2	*	8	*		*	*	*	*	*	*
05:30		3	*	0	*	3	*		*	*	*	*	*	*
05:45		11	*	1	*	12	*		*	*	*	*	*	*
06:00		9	*	0	*	9	*		*	*	*	*	*	*
06:15		19	*	1	*	20	*		*	*	*	*	*	*
06:30		14	*	1	*	15	*		*	*	*	*	*	*
06:45		14	*	0	*	14	*		*	*	*	*	*	*
07:00		14	*	1	*	15	*		*	*	*	*	*	*
07:15		15	*	2	*	17	*		*	*	*	*	*	*
07:30		15	*	4	*	19	*		*	*	*	*	*	*
07:45		36	*	6	*	43	*		*	*	*	*	*	*
08:00		30	*	7	*	37	*		*	*	*	*	*	*
08:15		37	*	31	*	68	*		*	*	*	*	*	*
08:30		44	*	31	*	75	*		*	*	*	*	*	*
08:45		25	*	5	*	30	*		*	*	*	*	*	*
09:00		22	*	7	*	29	*		*	*	*	*	*	*
09:15		17	*	11	*	28	*		*	*	*	*	*	*
09:30		23	*	7	*	30	*		*	*	*	*	*	*
09:45		32	*	3	*	35	*		*	*	*	*	*	*
10:00		29	*	5	*	34	*		*	*	*	*	*	*
10:15		10	*	7	*	17	*		*	*	*	*	*	*
10:30		19	*	5	*	24	*		*	*	*	*	*	*
10:45		11	*	4	*	15	*		*	*	*	*	*	*
11:00		11	*	4	*	15	*		*	*	*	*	*	*
11:15		9	*	5	*	14	*		*	*	*	*	*	*
11:30		6	*	3	*	9	*		*	*	*	*	*	*
11:45		7	*	8	*	15	*		*	*	*	*	*	*
Total		497	0	188	0	685	0		0	0	0	0	0	0
Day Total		497		188		685			0		0		0	
% Total		72.6%	0.0%	27.4%	0.0%				0.0%	0.0%	0.0%	0.0%		
Peak		07:45		07:45		07:45								
Vol.		146		77		223								
P.H.F.		0.830		0.621		0.743								
ADT		ADT 1,877		AADT 1,877										

APPENDIX B

HCS Worksheets

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*BKM*
Agency/Co.	*PHRA*
Date Performed	*2/24/2009*
Analysis Time Period	*AM Peak*

Site Information

Intersection	*Finch Lane/Rogues Road*
Jurisdiction	*Fauquier County*
Analysis Year	*2008_Existing*

Project Description *10428-E-9*

East/West Street: *Finch Lane*

North/South Street: *Rogues Road*

Intersection Orientation: *North-South*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*131*	*210*			*75*	*8*
Peak-Hour Factor, PHF	*0.71*	*0.71*	*1.00*	*1.00*	*0.94*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*184*	*295*	*0*	*0*	*79*	*8*
Percent Heavy Vehicles	*2*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*1*		*79*			
Peak-Hour Factor, PHF	*0.69*	*1.00*	*0.69*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*1*	*0*	*114*	*0*	*0*	*0*
Percent Heavy Vehicles	*2*	*0*	*2*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*184*						*115*	
C (m) (veh/h)	*1509*						*960*	
v/c	*0.12*						*0.12*	
95% queue length	*0.42*						*0.41*	
Control Delay (s/veh)	*7.7*						*9.3*	
LOS	*A*						*A*	
Approach Delay (s/veh)	--	--				*9.3*		
Approach LOS	--	--				*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*BKM*
Agency/Co.	*PHRA*
Date Performed	*2/24/2009*
Analysis Time Period	*PM Peak*

Site Information

Intersection	*Finch Lane/Rogues Road*
Jurisdiction	*Fauquier County*
Analysis Year	*2008_Existing*

Project Description *10428-E-9*

East/West Street: *Finch Lane* North/South Street: *Rogues Road*

Intersection Orientation: *North-South* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*66*	*84*			*243*	*9*
Peak-Hour Factor, PHF	*0.71*	*0.71*	*1.00*	*1.00*	*0.94*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*92*	*118*	*0*	*0*	*258*	*9*
Percent Heavy Vehicles	*2*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*10*		*124*			
Peak-Hour Factor, PHF	*0.69*	*1.00*	*0.69*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*14*	*0*	*179*	*0*	*0*	*0*
Percent Heavy Vehicles	*2*	*0*	*2*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*92*						*193*	
C (m) (veh/h)	*1297*						*738*	
v/c	*0.07*						*0.26*	
95% queue length	*0.23*						*1.05*	
Control Delay (s/veh)	*8.0*						*11.6*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*11.6*	
Approach LOS	--	--					*B*	

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	BKM
Agency/Co.	PHRA
Date Performed	3/10/2009
Analysis Time Period	AM Peak

Site Information

Intersection	Finch Lane/Rogues Road
Jurisdiction	Fauquier County
Analysis Year	2014_Buildout

Project Description 10428-E-9

East/West Street: Finch Lane | North/South Street: Rogues Road

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	224	281			101	21
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	235	295	0	0	106	22
Percent Heavy Vehicles	2	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	3		125			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	3	0	131	0	0	0
Percent Heavy Vehicles	2	0	2	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	235						134	
C (m) (veh/h)	1458						885	
v/c	0.16						0.15	
95% queue length	0.57						0.53	
Control Delay (s/veh)	7.9						9.8	
LOS	A						A	
Approach Delay (s/veh)	--	--				9.8		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	BKM
Agency/Co.	PHRA
Date Performed	3/11/2009
Analysis Time Period	PM Peak

Site Information

Intersection	Finch Lane/Rogues Road
Jurisdiction	Fauquier County
Analysis Year	2014_Buildout

Project Description 10428-E-9

East/West Street: Finch Lane | North/South Street: Rogues Road

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	166	113			326	16
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	174	118	0	0	343	16
Percent Heavy Vehicles	2	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	32		264			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	33	0	277	0	0	0
Percent Heavy Vehicles	2	0	2	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	174						310	
C (m) (veh/h)	1200						606	
v/c	0.14						0.51	
95% queue length	0.51						2.91	
Control Delay (s/veh)	8.5						17.0	
LOS	A						C	
Approach Delay (s/veh)	--	--				17.0		
Approach LOS	--	--				C		

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